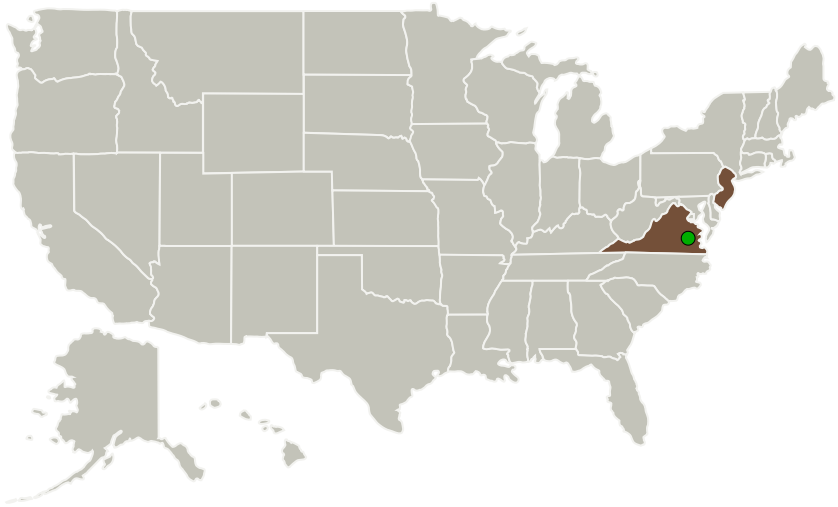
Narrow Wavelength, Frequency Modulated Source at 1.5 Wavelength, Phase II

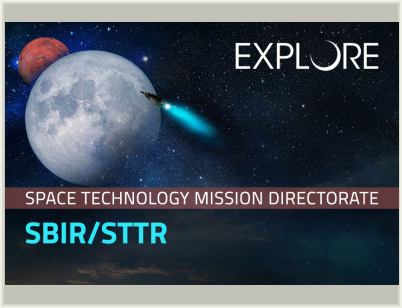
Completed Technology Project (2011 - 2013)

Project Introduction

Ultrastable, narrow linewidth, tunable, high reliability sources at 1.5 or 2mm are needed for high performance LIDARs for several NASA applications, including wind speed measurement, surface topography, earth and planetary atmosphere composition measurements. Princeton Optronics proposes to develop a low noise, narrow linewidth, 10W output MOPA source at 1500nm using a tunable, low noise, narrow linewidth, FM modulated seed laser as a master oscillator coupled to a fiber amplifier. The technology developed in this SBIR could be applied to develop a Thulium MOPA at 2mm. The proposed program will develop a MOPA laser system assembled in a small robust package for field applications. The optical design of the system comprises the FM solid-state microchip seed laser in which a FM source drives the piezo tuning actuator in the microchip laser to provide >5GHz frequency modulation at 1kHz rates. The microchip laser is designed for output power of >20mW in single frequency, linear polarized, single transverse mode. This is coupled into the fiber amplifier to produce 10W output with the same narrow linewidth and FM modulation as the seed laser. Isolators are used between the seed and fiber amplifier to prevent ASE and reflections causing noise and lasing of the amplifier.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Princeton Optronics, Inc.	Lead Organization	Industry	Mercerville, New Jersey
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
New Jersey	Virginia

Project Transitions

June 2011: Project Start

May 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139158)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Princeton Optronics, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Laurence S Watkins

Co-Investigator:

Laurence Watkins

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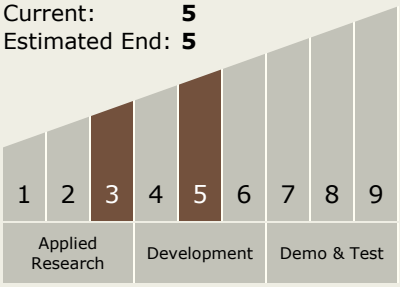
Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.2 Electronics

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System